Wyckoff Shellfish Sampling Field Report

Wyckoff/Eagle Harbor Superfund Site

Bainbridge Island, WA

Sampling Performed: July 5-6, 2016

Prepared By:
Technical Services Branch

US Army Corps
of Engineers ®
Seattle District

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1.0 Introduction

The U.S. Army Corps of Engineers (USACE) has been conducting shellfish sampling events to support the requirements of the Record of Decision (ROD) [USACE, 1994] at the Wyckoff Superfund Site, located in Bainbridge Island, Washington. This work was conducted in accordance with the 2016 Quality Assurance Project Plan (QAPP) [USACE, 2016]. This environmental sampling event was designed to obtain shellfish (clam) tissue analytical data as part of the existing monitoring for this site. Data from this sampling event will also be used in the next Five Year Review.

2.0 Project Background

The Wyckoff/Eagle Harbor Superfund site is located on the southern shoreline near the entrance to Eagle Harbor and has four operable units (OUs). The sampling at this time was conducted in the East Harbor Operable Unit (EHOU). A 40-acre wood-treating facility contributed to contaminated soil and groundwater, contaminated sediments in adjacent Eagle Harbor, and other upland sources of contamination to the harbor, including a former shipyard. The Remedial Investigation conducted by EPA identified mercury and polynuclear aromatic hydrocarbons (PAHs) as the principal contaminants of concern in marine sediments. In addition, the ROD for the Wyckoff / Eagle Harbor Superfund site named polycyclic aromatic hydrocarbons and metals as the major risk drivers resulting from consumption of seafood near Eagle Harbor.

The soil and groundwater remedy was a pump and treat system that maintains hydraulic control, and a sheet pile wall that prevents contaminated soil and groundwater from entering the harbor. Residual contamination exists outside the sheet pile wall and can be seen in the form of low-tide seeps in the intertidal area on the East Beach and North Shoal.

There are no established tissue-based PAH protectiveness goals in the ROD. The ROD states a sediment-based human health objective of 1,200 ug/kg dry wt high-molecular weight polycyclic aromatic hydrocarbons (HPAH), based on the 90th percentile of background Puget Sound subtidal sediments. HPAHs were considered to have approximated the carcinogenic PAHs evaluated during risk assessment.

3.0 Project Objectives

The purposes of the work performed at the Wyckoff site for this field sampling event and identified in the QAPP are to:

- Obtain clam tissue sampling data for contaminants of concern described in the ROD.
- Determine if clam tissue contamination levels have changed due to natural recovery.

- Collect site-specific background clam tissue data.

Clam tissue PAH concentrations will be used in the next Five-Year Review and to update sampling locations and procedures as appropriate. The work was completed during the low tides in July 2016. Collection and analysis will assist EPA to assess the natural recovery process. The ROD states that monitoring is necessary to document natural recovery.

4.0 Summary of Field Activities

The shellfish sampling team was comprised of personnel from USACE (Jake Williams (field lead), Kristen Kerns, Blair Kinser, Marlowe Laubach, Alex Meincke, Jayson Osborne, Aaron King, Zach Wilson, and Nancy Gleason). Helen Bottcher and Kathryn Cerise (EPA), as well as Debbie Kay (Suquamish Tribe) also attended the field activities. Shellfish sampling was conducted on July 5th and 6th, 2016.

Horse clams (*tresus capax*) were collected within the EHOU intertidal areas: West Beach, Intertidal Cap, North Shoal, and East Beach). It was anticipated that a shellfish sample would be collected from three different locations within each intertidal area (with the addition of one field duplicate in each area). It was determined that a shellfish sample would make up 3 horse clams of at least 6 inches to provide enough tissue sample for analysis. Sampling locations in each intertidal area were determined by the location of potential clam siphon holes on the sediment surface. Shellfish samples were collected for the following laboratory analysis: PAHs (method 8270D) and lipids (Bligh- Dyer method). GPS point location of the clam locations were also taken. All samples were hand delivered in iced shipping coolers (by Jayson Osborn) under chain of custody to Manchester Environmental Lab, Port Orchard, Washington on 5 July 2016.

At the request of EPA, 20 varnish clams were also collected. No sample analysis was performed on the tissue from these clams. This clam sample was sent to the lab and shucked and weighed to determine the amount of clams needed to perform a tissue analysis in the future, should analysis for varnish clams tissue be required.

Background Sampling

Part of the goal of this sampling effort was to retrieve background horse clam tissue data. In coordination with the Suquamish Tribe, it was determined that Point No Point park, located on the northern end of Kitsap Peninsula, would provide an acceptable background level for clams in that region of the Puget Sound, including at the Wyckoff Site. On July 6th, 2016 USACE (Jake Williams, Marlowe Laubach and Alex Meincke), EPA (Helen Bottcher), and the Suquamish Tribe (Debbie Kay) went to Point No Point Park to try to retrieve 3 samples of clams to use as background data.

The clams that were found on this beach were primarily horse clams of the species *Tresus nuttallii*, and not the desired *Tresus capax*. The clams at this location were also buried deeper

and harder to retrieve compared to the Wyckoff site. The sampling team was able to retrieve one clam (*Tresus nuttallii*) 6 inches long for sample analysis. One clam does not provide the lab with the minimum amount of tissue sample needed to run the standard 8270D analysis for PAHs. USACE contacted the MEL lab and MEL indicated they could run 8270D analysis on whatever tissue was recovered, however MEL indicated that there may be a higher reporting associated with this sample, due to lack of tissue mass recovered.

5.0 Safety Briefing

All sampling activities were conducted under Worker Protection Level D. Personal protective equipment included Nitrile gloves, steel-toed rubber boots, safety glasses, and appropriate field work clothing. Prior to conducting fieldwork, all samplers reviewed the activity hazard analysis in the Health and Safety Plan. Prior to commencing work, a safety briefing was given by the field sampling lead in which general hazards were covered at the work site, and all field personnel, after having read the site-specific safety and health planned, signed the acknowledgement form. A copy of the signed acknowledgement form is included in Appendix B.

5.1 Sampling Activities

On July 5, 2016, USACE personnel arrived at the Wyckoff/Eagle Harbor site well in advance of a minus tide predicted for mid-day. The USACE field team mobilized to the beach, and split into two sub-teams of four persons each – with teams starting on the western side of the beach. The sampling team familiarized themselves with the target shellfish species to be collected, the horse clam (*Tresus capax*), employing field guides.

Using clam rakes, buckets, shovels, and stainless steel spoons and bowls, the two sub-teams actively began clam sampling within the sampling areas as the field lead stayed at the van to process the clam samples as they were collected. Field work began at approximately 0930.

The samplers used their clam shovels and rakes to gently remove material within about a one foot diameter circle area around an exposed siphon hole. A wooden dowel was simultaneously placed down the exposed siphon hole until the user felt it hit the clamshell. This was done to track the location of clam, while others were digging around and eventually under the exposed clam to retrieve it. The clam was then measured to be sure it was of adequate size (6 inches), wrapped in foil and then placed in its respective Ziploc bag. The two sampling sub-teams worked moving to sampling areas throughout the beach. It took approximately 3 hours of work for a team to finish sampling in the first two sampling areas. Each team had one member dedicated to field notes, taking pictures, recording GPS points, and delivering samples to be processed. Shellfish sampling was completed by 1430 before the incoming tide inundated the intertidal clam band.

In total, the sampling teams collected all proposed samples except for two primary samples and a field duplicate in the North Shoal area and a field duplicate in the West Beach location.

This was because not enough horse clams in a similar area could be located for field duplicates. It was difficult to locate horse clams (*Tresus Capax*). Because of this difficuly, some of the horse clams (*Tresus nuttallii*) were collected as samples for the East Beach area.

Varnish clams were easily located throughout the beach, approximately two-four inches beneath the surface. A team searched in the Intertidal Cap area for varnish clams and easily located 20 varnish clams to be sent to the lab for tissue weight.

On July 6th, at Point No Point on Bainbridge Island, the same sampling procedures were followed, however retrieved only one horse clam (*Tresus nuttallii*) due to the difficulty of retrieving the clams.

Sand and other debris were removed from the clam prior to placing them in Ziploc® bags. Each bag was labeled with a unique sample ID number (cross- referenced in the field book and sample matrix) using indelible ink.

5.2 Significant Observations

Significant sheen and creosote was visibly noticeable on both sediment and shellfish on East Beach and North Shoal at the Wyckoff site. The odor was strong and sheen/creosote was observedto two feet deep in the sediment. The shellfish at the site, particularly on East Beach, are still clearly in contact with creosote. On East Beach and North Shoal, more *Tresus nuttallii* species clams were found, compared to the Intertidal Cap and West Beach, where primarily *Tresus capax* were found. A variety of marine organisms and birds were noted in the area during the low tides, including: mussels, barnacles, moon snails, herons and gulls. Appendix C contains photos from the sampling event.

5.3 Decontamination of Equipment and Waste Disposal

Stainless steel bowls, shovels, and clam rakes were used to collect the shellfish samples. No field decontamination in-between samples was needed. Therefore, no waste was produced in the field aside from used paper towels and nitrile gloves. These were properly disposed into a waste receptacle after being double-bagged in plastic garbage bags. Brushes were brought from Seattle District for decontamination of all equipment and personal PPE used. The hose near the pump and treat building was used for decontamination of all PPE. The wheels of the van were also washed.

5.4 Sample Packaging and Shipping

After sample collection was completed, the labeled shellfish sample bags and sediment jars were divided up and placed into pre-iced sample coolers. Gel ice packs were placed into several gallon size Ziploc® bags to keep the samples cool until being frozen by the laboratory. A chain of custody form was affixed to the inside lid of each cooler listing the cooler contents. Two shipping coolers were hand delivered by Jayson Osborne to MEL on 5 July

2016 for subsequent rinsing with deionized water, freezing for later tissuemizing, homogenization, and analysis. Chain of custody (COC) copies can be found in Appendix B.

On 6 July 2016, one cooler was hand delivered to MEL by the USACE field team, following all the same procedures as above.

6.0 Deviations from the QAPP – COC Discrepancies

In general, field activities were conducted in accordance with the Quality Assurance Project. As specified above, not all samples that were proposed in the QAPP were retrieved due to inability to locate the correct clam species at the Wyckoff site, and the difficulty to retrieve samples at Point No Point beach. All chain of custody forms were filled out accordingly and updated according to EPA's protocol in Scribe.

7.0 Laboratory Analysis

MEL performed all analyses for the project. The following analytical methods were used:

- Polycyclic aromatic hydrocarbons (PAHs) – EPA 8270D
- Lipids – Bligh-Dyer Method

Conclusion of Field Sampling Report

References

USACE (1994) U.S Army Corps of Engineers. *Record of Decision – Wyckoff Co./Eagle Harbor.* September 1994.

USACE (2016) U.S Army Corps of Engineers. *Quality Assurance Project Plan Update – Wyckoff/Eagle Harbor Superfund Site*. June 2016

APPENDIX A
Project Location and Site Maps

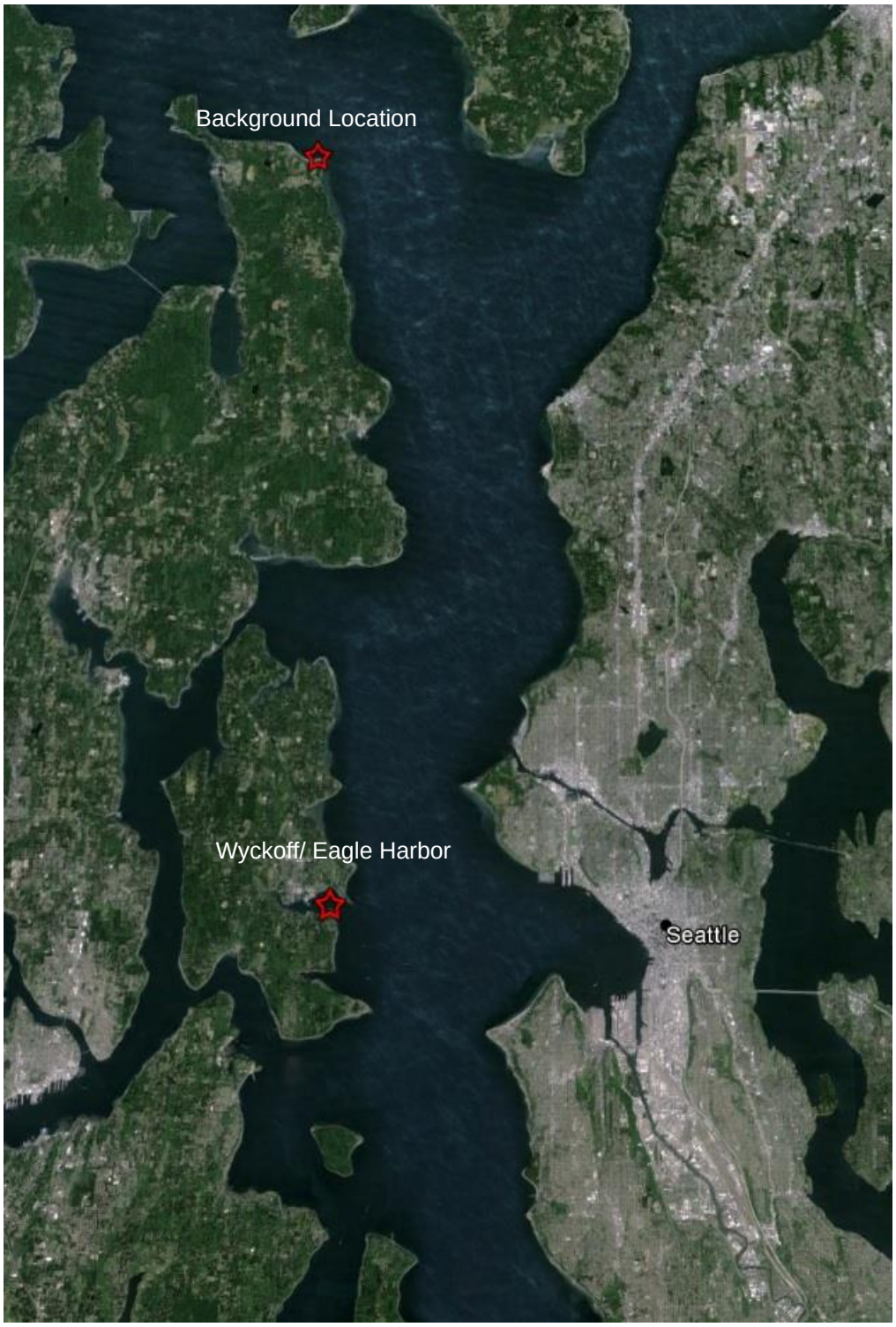

Figure 1. Sampling Locations Vicinity Map

Figure 2 Location of sampling points at the Wyckoff site

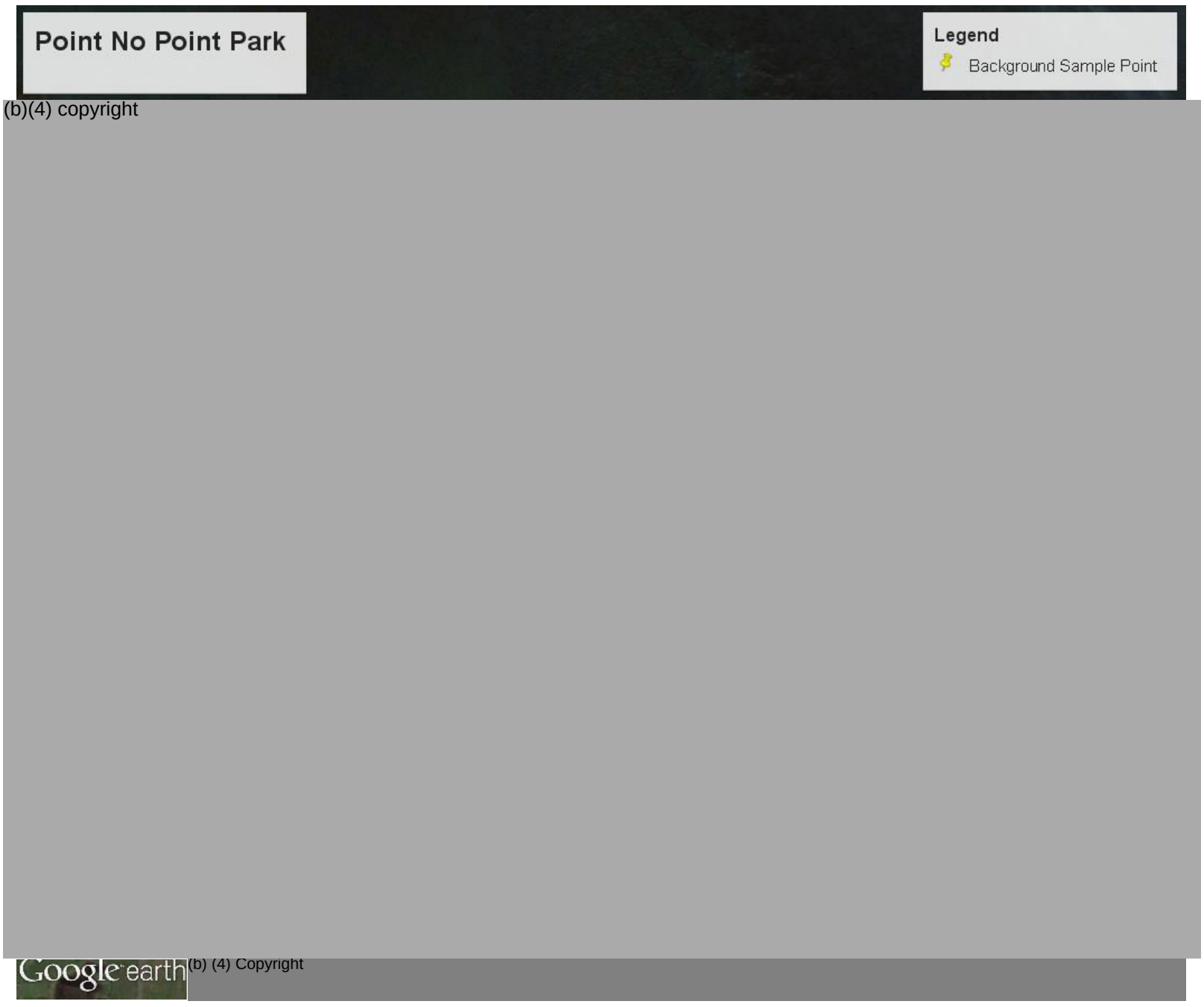

Figure 3 Map of background location sampling area

APPENDIX B
Field Notes, Acknowledgement Form, COC Forms

WYCKOFF CLAM SAMPLING
BAINBRIDGE ISLAND, WASHINGTON
DATE REVISED: 12 April 2016

SITE-SPECIFIC SAFETY AND HEALTH PLAN Review

Prepared by:

_____ _____

Deborah Johnston Date

Army Corps of Engineers Review

_____ _____

Signature Date

_____

Name (print)

The following personnel have reviewed a copy of the SSHP. By signing below, these personnel indicate that they have read the plan, including all referenced information, and that they understand the requirements which are detailed for this project.

PRINTED NAME	SIGNATURE	PROJECT DUTIES	DATE
Jake Williams		Sampling	7/5/16
Nancy Gleason		sampling	7/5/16
Marlowe Laubach		sampling	7/5/16
Kathryn Cerise		"	7/5/16
Helen Bottcher		"	7/5/16
Aaron King		"	7/5/16
Zach Wilson		"	7/5/16
KRISTEN [illegible]		"	7/5/16
Jayson Osborne		"	7/5/16
Alex Metcalfe		" "	7/5/16
Blair Fraser		" "	" "

Rite in the Rain
ALL-WEATHER WRITING PAPER

Name Blair C Kinser

Address

Phone 206 764 6875

Project Wyckoff

Clear Vinyl Protective Slipcovers (Item No. 32) are available for this style of notebook. Helps protect your notebook from wear & tear. Contact your dealer or JL Darling LLC.

CONTENTS

Sample: EB-3
Time:

Notes: Depth
N/A

Sample: EB-4
Time:

Notes: Field Duplicate
Depth
N/A

Sample: NS-1
Time: 1330

Notes: Depth - 15"
Nutella

Sample: NS-2
Time:

Notes: Depth -
N/A
No species of interest located

Sampling ID	Time	Note
EB-1	N/A	
EB-2	N/A	
EB-3	N/A	
EB-4	N/A	Duplicate
NS-1	1330	
NS-2	N/A	
NS-3	N/A	
NS-4	N/A	Duplicate
WB-3a	1046	
WB-3	1109	~~MS/MSD~~ Bch
WB-2	1300	> Same GPS point
WB-1	1245	

Sample: EB-1
Time:

Notes: Depth -
N/A

Sample: EB-2
Time:

Notes: Depth -
N/A

Time: 1300

Note: Depth ≥ 18" ave on all

Same GPS point within 15'

WB-1

Time 1245

Note: Depth ≥ 18" Avg

Species of interest were collected in WB-1 area WB-2 also collected in area.

Sample: NS-3
Time:

Notes: Depth -

N/A No species of interest located

Sample: NS-4
Time:

Notes: Duplicate
Depth -

N/A No species of interest located

Sample: WB-2a
Time: 1046

Notes: Depth - Clam 1 - ~~24~~ 16"
Clam 2

Sample: WB-3b
Time: 1109

Notes: Depth - Clam 1 24"
GPS point taken within 15ft radius of samples
Clam 2 - 18"
Clam 3 - 18"

Sample: IC ~~2~~ 1
Time: 1103 am

Notes: Depth: ~~1 ft~~ 12 in
10 inches
10 inches

~~Sample: IC4 (Field Duplicate)~~
~~Time: 11:07 am~~

~~Notes: Depth 17 cm~~

Sample: IC 2
Time: 1135

Notes: Depth: 9 in
12 in
8 in

Sample: ~~1~~ IC 4 (Field Duplicate)
Time: 11:42 am

Notes: Depth: 12 in
14 in
12 in

Sample: IC3
Time: 11:56 am

Notes: Depth 8 in
8 in
10 in

Sample: EB 1
Time: ~~12:56~~ 12:56 pm

Notes: Depth: 9 in ~~(a)~~
15 in ~~(a)~~
~~8 in~~ 8 in
- Questionable Species
- ~~Lots of Sheen (oily)~~

Sample: EB 2
Time: 1:01 pm

Notes: Depth: - 8 in
- 9 in
- 8 in
- Questionable species
- lots of oily sheen

~~Sample: EB 3~~
~~Time~~

~~Notes: Depth: 9 in~~
~~10 in~~
~~9 in~~

~~oily sheen, Questionable Species~~

Sample: EB 3
Time: 1:57 pm

Notes: Depth 12 in
12 in
12 in

Sample: EB 4 (Duplicate of EB 3)
Time: 2:00 pm

Notes: Depth: 12 in

- Only 2 samples
- 1 of each species

July 6, 2016

Sample:
Time:

Notes: Depth

Sample:
Time:

Notes: Depth:

Sample: Point + No Point Background (B-1)
Time: 12:33 am

Notes: Depth 32 in
Questionable Specimen

SAMPLE:
Time:

Notes: Depth:

EPA R10 Lab (MEL) COC (LAB COPY)

CHAIN OF CUSTODY RECORD

No: 10-061716-114334-0001

DateShipped: 7/5/2016

2016T10P302DD210S1LA00

CarrierName: Hand Deliver

Project Code: WEH-021C

Contact Name: Jake Williams

AirbillNo: NA

Cooler #: 1

Contact Phone: 206 316 3157

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
16274200		Clam Tissue/ Kerns, King, Wilson	Grab	PAH_PL(8 Weeks)	N1 (< 6 C) (1)	East Beach 1	07/05/2016 12:36	
16274201		Clam Tissue/ Kerns, King, Wilson	Grab	PAH_PL(8 Weeks)	N1 (< 6 C) (1)	East Beach 2	07/05/2016 13:01	
16274202		Clam Tissue/ Kerns, King, Wilson	Grab	PAH_PL(8 Weeks)	N1 (< 6 C) (1)	East Beach 3	07/05/2016 13:57	
16274203		Clam Tissue/ Kerns, King, Wilson	Grab	PAH_PL(8 Weeks)	N1 (< 6 C) (1)	East Beach 3	07/05/2016 14:00	
16274204		Clam Tissue/ Laubach, Osborne, Gleason	Grab	PAH_PL(8 Weeks)	N1 (< 6 C) (1)	North Shoal 1	07/05/2016 13:30	
16274220		Clam Tissue/ Kerns, King, Wilson	Grab	Shuck & Weight	A (< 6 C) (1)	Eagle Harbor	07/05/2016 10:30	

Sample(s) to be used for Lab QC: 16274201 Tag N1 - Special Instructions: Lab QC first day if possible with provided sample	**Shipment for Case Complete? N**
	Samples Transferred From Chain of Custody #
Analysis Key: PAH_PL=PAHs and Percent Lipids	

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt

EPA R10 Lab (MEL) COC (LAB COPY)

CHAIN OF CUSTODY RECORD

No: 10-062116-105523-0002

DateShipped: 7/6/2016

2016T10P302DD210S1LA00

CarrierName: Hand Deliver

Project Code: WEH-021C

Contact Name: Jake Williams

AirbillNo:

Cooler #: 2

Contact Phone: 206 316 3157

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
16274216		Clam Tissue/ Williams, Meincke, Laubach	Grab	PAH_PL(8 Weeks)	N1 (< 6 C) (1)	PNP 1	07/06/2016 12:30	

Special Instructions:	**Shipment for Case Complete? Y**
	Samples Transferred From Chain of Custody #
Analysis Key: PAH_PL=PAHs and Percent Lipids	

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt

EPA R10 Lab (MEL) COC (LAB COPY)

CHAIN OF CUSTODY RECORD

No: 10-062816-102333-0003

DateShipped: 7/5/2016

2016T10P302DD210S1LA00

CarrierName: Hand Deliver

Project Code: WEH-021C

Contact Name: Jake Williams

AirbillNo: NA

Cooler #: 3

Contact Phone: 206 316 3157

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
16274208		Clam Tissue/ Kerns, King, Wilson	Grab	PAH_PL(8 Weeks)	N1 (< 6 C) (1)	Intertidal Cap 1	07/05/2016 11:03	
16274209		Clam Tissue/ Kerns, King, Wilson	Grab	PAH_PL(8 Weeks)	N1 (< 6 C) (1)	Intertidal Cap 2	07/05/2016 11:35	
16274210		Clam Tissue/ Kerns, King, Wilson	Grab	PAH_PL(8 Weeks)	N1 (< 6 C) (1)	Intertidal Cap 3	07/05/2016 11:58	
16274211		Clam Tissue/ Kerns, King, Wilson	Grab	PAH_PL(8 Weeks)	N1 (< 6 C) (1)	Intertidal Cap 2	07/05/2016 11:42	
16274212		Clam Tissue/ Laubach, Osborne, Gleason	Grab	PAH_PL(8 Weeks)	N1 (< 6 C) (1)	West Beach 1	07/05/2016 13:05	
16274213		Clam Tissue/ Laubach, Osborne, Gleason	Grab	PAH_PL(8 Weeks)	N1 (< 6 C) (1)	West Beach 2	07/05/2016 13:10	

Special Instructions:	**Shipment for Case Complete? N**
	Samples Transferred From Chain of Custody #
Analysis Key: PAH_PL=PAHs and Percent Lipids	

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt

EPA R10 Lab (MEL) COC (LAB COPY)

CHAIN OF CUSTODY RECORD

No: 10-062816-102333-0003

DateShipped: 7/5/2016

2016T10P302DD210S1LA00

CarrierName: Hand Deliver

Project Code: WEH-021C

Contact Name: Jake Williams

AirbillNo: NA

Cooler #: 3

Contact Phone: 206 316 3157

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
16274214		Clam Tissue/ Laubach, Osborne, Gleason	Grab	PAH_PL(8 Weeks)	N1 (< 6 C) (1)	West Beach 3	07/05/2016 11:35	

Special Instructions:	**Shipment for Case Complete? N**
	Samples Transferred From Chain of Custody #
Analysis Key: PAH_PL=PAHs and Percent Lipids	

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt

APPENDIX C
Sampling Event Photos

View of Wyckoff/Eagle Harbor site looking east from the west beach

USACE field team digging for clams on west beach. Bainbridge Island ferry terminal seen in the background

Tresus capax horse clam found on the intertidal cap beach area

Wooden dowel used to locate clams

Sheen on clams in the east beach area

Sheen easily visible on surface of east beach area